Community-Engaged Decision Modeling for Local Economic Development

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COMMUNITY-ENGAGED DECISION MODELING FOR LOCAL ECONOMIC DEVELOPMENT

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Problem motivation

- Devolution in American governance has resulted in public-private partnerships to deliver important services (Ketti, 2000)
- Thousands of Main Streets organizations partner with municipalities to support local economic development (Robertson, 2004; Seidman, 2004)
- In the city of Boston, 20 Main Street Districts are required to report process and outcome data through a monthly survey to their primary funder, the Department of Neighborhood Development
- Generally, MSDs feel that the data they must report are not those that they feel reflect the real nature of their work or measures of impact.

What economic development success metrics should Main Street organizations collect? How can these data help them choose local initiatives to pursue?
Problem details

• Main Streets tasks: physical improvements, technical assistance to businesses, marketing and place-building
• Types of data that Boston MSDs currently collect: business vacancy rates, volunteer hours, business owner contacts, etc.
• Boston MSDs have very limited resources to perform their activities
• Disconnection between knowledge and use of data analytics & information technology (IT) and the needs of urban communities and marginalized populations (Johnson, 2015)
• Analytics often reflects large datasets, quantitative methods and a small set of objectives traditionally associated with the private sector or larger government organizations (Liberatore and Luo, 2010; Winston, Albright and Zappe, 2010)
Why is this a problem that our field should address?

• OR/MS provides systems thinking to broaden concept of outcomes (vs. outputs) and decision alternatives (vs. defined tasks) to support multi-attribute decision-making

• Keeney’s (1996) value-focused thinking approach can support development of values structures by which attributes and alternatives can be identified

• Community-based operations research (Johnson, 2012; Midgley and Ochoa-Arias, 2004) provide a theoretical framework for inductive, mixed-methods, community-engaged problem-solving

• Basis for design and application of diverse solution approaches in public-sector applications of OR/MS facility location, service area design, marketing science, project management
Current work supporting project

Analytic methods:

- Multi-site case study
- Descriptive analytics
- Value-focused thinking
- Objectives design
  - Facility location
  - Markov chain analysis
- Multi-objective optimization for site selection
- Markov decision models for property acquisition
- Stochastic multi-objective integer programming for strategy design
CBOR enlarges traditional notions of decision modeling

Decision modeling process could stop at any of these steps

- Place/neighborhood
- Community/social group
- Institutions/organizations

Multiple research frameworks
Multiple solution methods

Problem identification
Problem formulation
Problem solution

Multiple stakeholders
Collaborative
Evidence-based
Social welfare/Equity emphasis
CBOR enlarges traditional notions of decision modeling, continued
Value-focused thinking can be used to connect values with alternatives...

Source: Johnson, et al. (2015)
and to organize new decision strategies according to values-based objectives

<table>
<thead>
<tr>
<th>Fundamental Objective</th>
<th>Means Objective</th>
<th>What decisions/strategies are associated with each means/lower level/actionable objective?</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAX Quality of Area</td>
<td>MAX green space</td>
<td>Organize/provide for clean-up crews for vacant lots (linked to youth)</td>
</tr>
<tr>
<td>Approximate to Units</td>
<td>Create/sustaining green spaces from new opportunity spaces</td>
<td>Turn vacant lots near multi-units into active green space e.g. playgrounds</td>
</tr>
<tr>
<td></td>
<td>MAX quality of amenities</td>
<td>Expand farmers market on Main St.</td>
</tr>
<tr>
<td></td>
<td>MAX accessibility of units to amenities</td>
<td>Attract/develop more commercial enterprises (e.g. restaurants)</td>
</tr>
<tr>
<td></td>
<td>Increase downtown rental development</td>
<td>Address vacant store-fronts on Main pre-destined use to code/make ready for new businesses</td>
</tr>
<tr>
<td></td>
<td>Locate green/community space close to occupied units</td>
<td>Expand tenant meeting space/on-site services</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MAX Spending/ private investment/ municipal investment</th>
<th>MAX impact of responsible investors/ M&amp;U impact of speculation</th>
<th>MAX number of responsible owners/occupants</th>
<th>MAX Quality of individual Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase availability of capital in Fitchburg generally</td>
<td>Partnership opportunities w/private property owners that seek resources (e.g. technical/administrative assistance, coordinate on adjoining props?)</td>
<td>Use receivership</td>
<td>Hire resident services coordinator in Fitchburg - for case management and community building</td>
</tr>
<tr>
<td>Use local sources to access credit for developing/ rehabbing residential investors and mixed use properties</td>
<td>Become the go-to source for large projects, not developer of last resort</td>
<td>Offer assistance accessing financing, resources to private homeowners</td>
<td>Tenant associations, Neighbor Circles</td>
</tr>
<tr>
<td>Work with redevelopment authority to increase commercial property (i.e. small business) funding</td>
<td>Serve as advisor/consultant/go-to source for new neighborhood investments/developments?</td>
<td>Hire resident services coordinator in Fitchburg - for case management and community building</td>
<td></td>
</tr>
</tbody>
</table>

Source: Johnson, et al. (2015)
Our analytic strategy

• A single focus group of community stakeholders reflecting all of Boston’s MSDs would be unwieldy
• Instead, employ multi-site case study design: select small number of MSDs that, together, reflect city’s diversity
• For each MSD case, conduct interviews with individuals from defined stakeholder groups: business owners, property owners, nonprofit professionals, residents
• Extract values structures and look for commonalities and differences within and across case study communities
• Construct metrics that are essential, measurable and controllable
Research questions: Are there commonalities in values structures across stakeholder groups? Do economic development metrics appear to be specific to certain stakeholder groups? What might explain variations, if any, across stakeholder groups?
Multiple-case VFT-based analysis

Main Street district #1

Main Street district #2

Main Street district #3

Values structures

$\text{VS}_{\text{HP}}^{B}$
$\text{VS}_{\text{HP}}^{P}$
$\text{VS}_{\text{HP}}^{N}$
$\text{VS}_{\text{HP}}^{C}$

$\text{VS}_{\text{EB}}^{B}$
$\text{VS}_{\text{EB}}^{P}$
$\text{VS}_{\text{EB}}^{N}$
$\text{VS}_{\text{EB}}^{C}$

$\text{VS}_{\text{UC}}^{B}$
$\text{VS}_{\text{UC}}^{P}$
$\text{VS}_{\text{UC}}^{N}$
$\text{VS}_{\text{UC}}^{C}$

City-level values structure

Research questions: What variation is apparent in values structures across stakeholder groups and communities? What explains these variations, if any? Do certain types of economic development metrics appear to be specific to certain stakeholder groups and community types?
Synthesis of cross-case findings

If values structures do not vary greatly across communities, build performance metrics that comprise consensus most-important metrics for each of the four stakeholder groups.

If the cross-case analysis yields values structures that appear to be quite distinct across neighborhoods, conduct focus groups in which we would apply value-focused thinking to representatives of all of our target communities.
Selecting case study sites: Survey of Main Street district directors

Demographic characteristics

Racial and Ethnic Breakdown

- White
- Black
- Latino
- Asian
- Multi-Racial
- Native American
- Other
Selecting case study sites: Survey of Main Street district directors, continued

Service area (formal vs. actual)
Selecting case study sites: Survey of Main Street district directors, continued

Current understanding/use of data for management, operations, strategy design

“Is there anything that you want to measure in your district, but do not have the means to measure?”

• “Impact special events have on small businesses”
• “I wish I knew how to measure how businesses in the district were performing economically”
• “In general I have the means to measure the things I need to - what I lack is the capacity/systems to easily and regularly collect data.”
Current results

• Selected three Boston Main Street districts
• Conducted interviews in Hyde Park, East Boston
• Main Street directors advisory board wants focus on
  • Retail businesses versus service delivery
  • Stakeholders not closely tied to Main Street district, elected officials or other sources of influence or bias
• Detailed analysis:
  • Insurance broker, Hyde Park
  • Florist, Hyde Park
  • Property owner, Hyde Park
Sample Data: Property Owner, Hyde Park

- finds it extremely difficult to measure every objective
- Every neighborhood is different
- He manages properties in multiple neighborhoods: Hyde Park, East Boston, and Mattapan
- While he owns properties in these neighborhoods, he lives in Brookline
- He does not like the idea of non-owners telling what owners what to do
  - Might cause friction between property owners and tenants
- would love it if Emily and Main Streets can facilitate negotiations between owners and tenants
- Emily is a conduit between him and the neighborhood
- Also Tim McCarthy has helped
  - Great grandfather built the properties
    - Originally built to suit a large Woolworth's store
    - Shopping center was then redesigned to suit mom and pop stores.
- There are only two vacant spots among his Clearly Square properties
- finds it difficult to find qualified tenants
- Hyde Park was a middle class neighborhood
- Lots of African Americans, Haitians, Africans, Hispanics
  - These groups desire to open more businesses but they need capital
  - Many lack business experience and business model that would succeed
- Need to draw businesses from other community segments
  - Service-oriented stores
  - Find a tenant mix that actually works
  - Communities that have more disposable income
  - Can't find good tenants
- They've succeeded in Clearly Square.
  - Goal is to make money
    - Which he sees through making Clearly Square a vibrant shopping district

- Goal is to make money
  - Which he sees through making Clearly Square a vibrant shopping district
- How to measure level of integration in the community?
  - Needs a diversity of tenants that reflects the community
- Financial needs
  - $ for signs
  - $ for storefront
  - Loans
- Social problems → Perceptions
- Need to draw customers across boundaries
  - Social
  - Geographical
- Main Streets has managed to bring the community together
  - How to measure this?
    - Socio-economic diversity of tenants and customers
  - Need minority tenants who have business expertise
    - They need to have a formal education, not just Main Streets
    - MS is one organization that can organize
- Economy in neighborhood (real estate prices)
  - Some properties have lower rent than before the economic crash
    - Though there have been upticks in rent
- Resources for the entrepreneurs
  - UMB is a possible source
- Email organizations for volunteers who gave businesses assistance
- Entrepreneurial
  - Racial and ethnic tensions are a problem
    - Whites are more likely to say they don't shop in Clearly Square
      - Too many Blacks
    - Cross Racial comfort
  - Shared community
  - Why didn't the farmers' market work?
    - Farmers' market is an example of businesses that could attract a diverse clientele, by selling staples
    - But maybe too expensive
  - Family Dollar
  - Why did that store fail when it could have succeeded
    - was talking about the butcher
Insurance broker: Means-ends network

Maximize viability of business district

Maximize quality of customer relationships
- Maximize accessibility to customers
  - Home calls
- Open late nights and weekends

Maximize perception of business-friendly district
- Maximize cross-cultural flexibility
- Maximize customer parking
- Maximize traffic congestion
- Maximize quality of signage
- Maximize business supports offered by Main Streets
  - More market research
  - Increased networking opportunities with other local businesses
Insurance broker: Fundamental values hierarchy

- Maximize viability of business district
  - Maximize customer experience within business district
    - Maximize customer experience when shopping
      - Maximize perception of physical safety
        - Associated with criminal activity
      - Maximize physical attractiveness
        - Associated with quality of life
        - Associated with signage
    - Maximize customer experience when traveling to/from business
  - Maximize business experience within business district
    - Maximize experience for retailers
    - Maximize experience for service providers
      - Maximize customer contacts
        - By email
        - By phone
        - In person
      - Maximize business supports from Main Street
        - By networking
        - Via Internet
        - For marketing
        - For Web presence
Florist: Means-ends network

Maximize vitality of neighborhood

- Maximize business district health
- Maximize Main Streets support to businesses
  - Maximize cooperation between businesses
    - Maximize advocacy on behalf of businesses at City Hall
  - Maximize technical assistance to businesses
    - Maximize representation of businesses on Main Streets board
- Maximize health of individual businesses
  - Maximize focus on single product or service
- Maximize diversity within business district
  - Maximize diversity within clientele
- Maximize community health
  - Maximize local employment
  - Maximize understanding of diverse customer groups
Florist: Fundamental values hierarchy

- Maximize vitality of neighborhood
  - Maximize vitality of residential community
    - Maximize economic vitality
    - Maximize social vitality
  - Maximize local diversity
    - Maximize diversity of Main Streets board
    - Maximize diversity of businesses
    - Maximize diversity of clientele
  - Maximize vitality of business district
    - Maximize vitality of individual businesses
    - Maximize vitality of public spaces

  By gender
    - Male
    - Female
  By age
    - Adult
    - Youth
  By race and ethnicity
    - White
    - Black
    - Hispanic
  By national origin
    - US-born
    - Foreign-born

Younger adult
Older adult
Property owner: Means-ends network

Maximize community vitality

Maximize residential quality of life
- Increased diversity of clientele
- Improved shopping experience
- Increased consumer choice
- Increased diversity of goods and services
- Increased complementarity of goods and services
- Increased physical access
- Increased consumer spending
- Increased perception of safety

Maximize business viability and longevity
- Improved public transportation options
- Improved parking
- More frequent bus service
- Improvement in commuter rail stop aesthetics
- Less congested parking
- Better demarcation of parking spots

More technical and professional support to existing and potential entrepreneurs
- Increased university outreach
- Improved support from Main Streets
- Allow space for emergency vehicles
Property owner: Fundamental values hierarchy

Maximize community vitality

Maximize vitality of residential district
- Maximize individual health
  - Maximize physical health
  - Maximize emotional health
- Maximize social health
  - Maximize diversity
  - Maximize strength of social institutions

Maximize vitality of shopping district
- Maximize attractiveness to businesses
  - Maximize perception of safety
    - Minimize crime
    - Minimize loitering
  - Maximize convenience
    - Maximize accessibility
    - Maximize parking
    - Minimize traffic congestion
    - Maximize mass transit service
    - Maximize Internet presence
- Maximize profitability
  - Maximize technical capacity
  - Maximize capital resources
  - Maximize own resources
  - Maximize access to loans and grants
- Maximize appeal to customers
  - Maximize visual appeal
  - Maximize cross-cultural appeal
  - Maximize geographical appeal
- Maximize attractiveness to shoppers
  - Maximize convenience
  - Maximize visual appeal
  - Maximize sense of cultural accommodation
  - Maximize diversity of products
  - Maximize value
    - Full-price stores
    - Discount stores
    - Second-hand stores
    - Match between patrons' language and business language(s) spoken
      - Language
      - Representation
      - Cultural competence

Languages and cultural competence
- Match between patrons' language and business language(s) spoken
  - Language
  - Representation
  - Cultural competence
Findings

• Process:
  • Applying VFT principles in field interviews is hard!
  • Participatory action research is an essential frame for data collection and analysis

• Outcomes:
  • Diversity is very important to many stakeholders
    • Not addressed at all in Main Street data reporting protocols
    • Multiple dimensions: race/ethnicity/national origin/class; products/services provided; customer base; proprietors; Main Street committee
  • Technical capacity of businesses central to success
    • Marketing
    • Finance
    • Operations
  • Quality of life and vitality of business district and residents intertwined
  • Quantifying metrics will be challenging
Next steps

• Continue interviews
  • Within Main Streets districts
  • DND manager
  • Main Streets America manager
• Within-case analysis
• Cross-case analysis
• Recommendations
  • Economic development success metrics
  • Decision opportunities
• Implementation
  • Integration into DND information system
  • Prescriptive decision modeling
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References


